

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

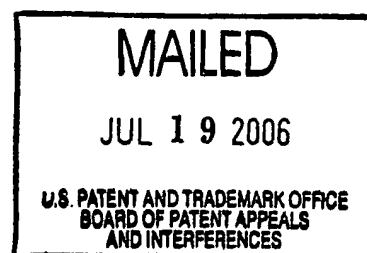
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte MUNETAKA TAKEUCHI, NOZOMU KAMIYA,  
HIROMI HAYASHI AND MAKOTO ISHITOBASHI

Appeal No. 2006-1820  
Application No. 08/889,440

HEARD: JULY 13, 2006



Before THOMAS, KRASS, and HOMERE, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1, 3-9, 11-20, and 22-31.

The invention relates to a system for simulating phenomena, such as crystal growth, surface adsorption and surface damage, of a particle formed of substrate particles and adsorbate particles.

Representative independent claim 1 is reproduced as follows:

1. An apparatus for simulating phenomena of a particle formed of adsorbate particles and substrate particles, comprising:

a kinetic condition setting unit which sets information for defining a plurality of generation periods and a corresponding number of adsorbate particles to be generated during each generation period wherein the information can include a position of a corresponding emission source, a temperature, a chemical composition of the particle, a region, a physical condition, a velocity of each atom forming the particle, and a direction; and

a particle motion computing unit which generates the adsorbate particles in accordance with the information set by the kinetic condition setting unit and computes motion of the generated adsorbate particles, to simulate phenomena of said particle formed of adsorbate particles and substrate particles, each adsorbate particle having a corresponding emission source wherein

for each adsorbate particle, the kinetic condition setting unit sets a region indicating a position of the corresponding emission source, and

the particle motion computing unit generates each adsorbate particle in accordance with the position of the corresponding emission source.

The examiner relies on the following references:

Misaka et al. (Misaka) 5,421,934 Jun. 6, 1995

Ohira et al. (Ohira), "Molecular-dynamics Simulations of Hydrogenated Amorphous Silicon Thin-Film Growth," Paper presented at the Fall Meeting of the Materials Research Society, Boston, U.S.A., pp. 1-6, November 1995.

Baumann et al. (Baumann), "3D Modeling of Sputter and Reflow Processes for Interconnect Metals," IEEE IEDM, pp. 4.4.1-4.4.4, 1995.

Yamada et al. (Yamada), "A Sputter Equipment Simulation System Including Molecular Dynamical Target Atom Scattering Model", IEEE IEDM, pp. 4.5.1-4.5.4, 1995.

Husinsky, et al. (Husinsky), "Fundamental aspects of SNMS for thin film characterization: Experimental studies and computer simulations", Thin Solid Films, Vol. 2, pp. 289-309, January 15, 1996.

Kinema/SIM Manual, published by ArSciMed, 1996.

Reeves, "Particle System – A Technique for Modeling a Class of Fuzzy Objects", ACM transactions on Graphics, pp. 91-108, April 1983.

Cohen, "Computer Animations, Quantum Mechanics and Elementary Particles", Europhys. News, pp. 163-166, 1992.

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Claims 1, 3-9, 11-20, and 22-31, all of the claims, stand rejected under 35 U.S.C. § 112, first paragraph, as relying on an inadequate written description as well as relying on a non-enabling disclosure.

Claims 1, 16, 20, 23, and 24 stand further rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 1, 3-9, 11-20, 22-31, all of the claims, stand further rejected under 35 U.S.C. § 103 as unpatentable over either one of Misaka or Baumann, in view of the examiner's "own experience" (Official notice).

Claims 1, 3-9, 11-20, 22-26, and 28-31 stand further rejected under 35 U.S.C. § 103 as unpatentable over either one of Yamada or Misaka or Baumann or Husinsky, in view of either one of Kinema/SIM or Reeves or Cohen.

Claims 1, 3-9, 11-20, and 22-31 stand still further rejected under 35 U.S.C. § 103 as unpatentable over Ohira in view of either one of Kinema/SIM or Reeves or Cohen.

Reference is made to the brief and answer for the respective positions of appellants and the examiner.

### OPINION

At the outset, we note that we find the examiner's seventy-five page answer unnecessarily wordy. For example, the "few introductory remarks" (answer-page 9), from pages 9-18, regarding the alleged tone of appellants' comments, arguments about alleged "other

versions” of the Kinema/SIM reference, and the mini-treatise on a prima facie case, from pages 14-18, are really unnecessary and immaterial and merely serve to obfuscate, rather than clarify the issues before us. The examiner may rest assured that we make our decisions on the evidence before us, and not on any perceived attitudes of the parties involved; that we will consider the “version” of a reference that the examiner bases the rejection on; and that we are well aware of the law relating to a prima facie case and 35 U.S.C. § 103. The answer would better serve us if the examiner got right to the point, succinctly stating the grounds of rejection, the rationale therefore, particularly identifying specific portions of the prior art alleged to teach specific claim limitations, particularly specifying what about the claims is indefinite with a full explanation as to why it is deemed indefinite in rejections under 35 U.S.C. § 112, second paragraph, and particularly specifying what about the claims is non-enabling or without proper written description, in rejections under 35 U.S.C. § 112, first paragraph.

Moreover, in rejections based on prior art, it would be most helpful if the examiner would limit his/her rejections to what is considered the most relevant, and best, art available to make the point alleged. For example, in rejecting claims 1, 3-9, 11-20, 22-26, and 28-31, under one of the plurality of rejections based on 35 U.S.C. § 103, the examiner bases the rejection on any one of four individual references, each one in view of either one of three additional references, which constitutes, in reality, twelve different rejections of the same claims. This is in addition to the other three different rejections of claims 1, 3-9, 11-20, and 22-31 under 35 U.S.C. § 103, and the additional two other rejections of claims 1, 3-9, 11-20, and 22-31 under 35 U.S.C. § 103. One

must question whether there might be one or two strongest rejections, based on the prior art, which the examiner could have made in lieu of the seventeen different rejections made by the examiner. Note MPEP § 706.02 I, which confines prior art rejections “strictly to the best available art.” Merely cumulative rejections should be avoided.

Turning, first, to the rejection under 35 U.S.C. § 112, second paragraph, the examiner contends that the phrase, “physical condition” in claims 1, 16, 20, 23, and 24, is “ambiguous” (answer-pages 28 and 49).

Since the examiner never indicates why the phrase “physical condition” is “ambiguous,” merely asserting so, the examiner has clearly not established any reasonable basis for concluding that the claims are indefinite under 35 U.S.C. § 112, second paragraph. Accordingly, we will not sustain the rejection of claims 1, 16, 20, 23, and 24 under 35 U.S.C. § 112, second paragraph.

With regard to the rejection of all of the claims under 35 U.S.C. § 112, first paragraph, the examiner employs exactly the same reasoning for both grounds of inadequate written description and non-enablement:

As per claims directed at “formed particles” (claims 1, 3-9 and 11-31), Examiner has reviewed pp. 31-33 of the specification. The specification only describes the composition of the combined particles; but, does not describe how the components of the formed (combined) particles are formed, as would be required to make and/or use the invention. A reader would have to reinvent the invention. The meaning is not clear. The claims recite “formed particles”. The particles therefore would have to be *combined* somehow during the course of the simulation. How is this done? It would constitute undue experimentation for a reader of any issued patent to make and/or use the claimed invention (answer-pages 48 and 49).

As the examiner is no doubt well aware, the written description requirement is separate from the enablement requirement of 35 U.S.C. § 112; it is not necessary that the claimed subject matter be described identically but that the originally filed disclosure convey to those skilled in the art that appellant had invented the subject matter now claimed. Precisely how close the original description must come to comply with the description requirement must be determined on a case by case basis as a question of fact. In re Barker, 194 USPQ 470 (CCPA 1977), cert den., sub. nom., Barker v. Parker, 197 USPQ 271 (1978); In re Wilder, 222 USPQ 369 (Fed. Cir. 1984), cert den., sub. nom.; Wilder v. Mossinghoff, 105 S. Ct. 1173 (1985).

We do not find the examiner's assertions reasonable and therefore will not sustain the rejections of claims 1, 3-9, 11-20, and 22-31 under 35 U.S.C. § 112, first paragraph, either under the enablement clause or the written description clause.

The claims recite nothing about "combined" particles, reciting only particles "formed of adsorbate particles and substrate particles." Accordingly, the examiner's remarks anent "combined" particles are irrelevant to the instant claimed subject matter. To the extent the examiner is stating that "formed" particles must be "combined" particles, we disagree. As asserted by appellants, at page 6 of the brief, particles formed as adsorbate particles and substrate particles are "well-known," and the examiner has offered no evidence to rebut that allegation.

As we read the claim language, e.g., claim 1, line 2, a particle "formed of adsorbate particles and substrate particles" is recited. No specific "combination" is recited. It merely states that there is a "particle" and that this "particle" is formed of at least two other particles, one being

an adsorbate particle and one being a substrate particle. Clearly, there is no problem under the written description clause as the original claims (see original claims 1 and 2) contained the recitation of a particle formed of substrate particles and adsorbate particles. An originally filed claim is its own written description. In re Wertheim, 541 F.2d 257, 264-5, 191 USPQ 90, 98 (CCPA 1976).

With regard to the enablement requirement of 35 U.S.C. § 112, first paragraph, as a matter of Patent and Trademark Office practice, a specification disclosure which contains a teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented *must* be taken as in compliance with the enabling requirement of the first paragraph of 35 U.S.C. § 112 *unless* there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. Assuming that sufficient reason for such doubt does exist, a rejection for failure to teach how to make and/or use will be proper on that basis; such a rejection can be overcome by suitable proofs indicating that the teaching contained in the specification is truly enabling, In re Marzucchi, 439 F.2d 220, 169 USPQ 367 (CCPA 1971); In re Sichert, 566 F.2d 1154, 196 USPQ 209 (CCPA 1977).

When a rejection is made on the basis that the disclosure lacks enablement, it is incumbent upon the examiner to explain why he/she doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions with acceptable evidence or reasoning which is inconsistent with the contested statement. The examiner has not advanced

any such evidence or an acceptable line of reasoning inconsistent with enablement and, therefore, has not sustained his/her burden. That is, the examiner has advanced no evidence that would indicate that the skilled artisan would not have known how to obtain adsorbate particles and substrate particles and /or how to obtain particles formed of these particles, without undue experimentation. In fact, it is not entirely clear to us what, exactly, the examiner is alleging is non-enabling about the instant claimed invention.

Since the examiner has given us no reason to doubt the objective truth of the what is disclosed in the specification, we find no rationale basis for alleging non-enablement of the instant claimed subject matter.

Thus, we will not sustain any of the rejections based on either the first or the second paragraph of 35 U.S.C. § 112.

We turn, now, to the rejections based on prior art.

The examiner offers multiple rejections. First, in rejecting all of the claims under 35 U.S.C. § 103, the examiner cites either one of Misaka or Baumann as a primary reference. Taking claim 1 as exemplary, the examiner contends, at page 50 of the answer, that either one of these references discloses simulating the dynamics of particles which are interacting with a substrate during processing of the substrate. In particular, the examiner points to Misaka's Figures 1, 2, 3b, 4, and 5, and column 1, lines 35-68, column 2, lines 29-34 and 49-59, column 3, lines 16-68, and column 4, lines 50-65; and to Baumann's Figure 1 and page 4.4.1 for a



disclosure of an apparatus for simulating phenomena of a particle formed of adsorbate particles and substrate particles.

With regard to a “kinetic condition setting unit,” the examiner alleges that this is “inherent” in particle simulators, such as Monte Carlo simulators. With regard to such a setting unit setting information for defining a plurality of generation periods and a corresponding number of adsorbate particles to be generated during each generation period, the examiner points to Misaka, at Figures 1, 2, 3b, 4, and 5, and to column 1, lines 35-68, column 2, lines 29-34, and 49-59, column 3, lines 16-68, and column 4, lines 50-65; or to Baumann at page 4.4.1 and Figure 1. With regard to this information which can include a position of a corresponding emission source, a temperature, a chemical composition of the particle, a region, a physical condition, a velocity of each atom forming the particle, and a direction, the examiner points to Misaka, at Figures 1, 2, and 5, and the abstract, as well as column 2, lines 29-34 and 49-64, column 3, lines 3-68, and column 4, lines 1-6; or to Baumann, identifying the temperature noted in Figure 6 and noting that this is “inherent” at page 4.4.1.

With regard to the claimed “particle motion computing unit...,” the examiner again asserts that this is “inherent” in particle simulators such as Monte Carlo simulators; and points to the abstract, Figures 1 and 2, and column 2, lines 49-64, column 3, lines 3-68, and column 4, lines 1-6 of Misaka, or page 4.4.1 of Baumann.

With regard to the claim limitation of “for each adsorbate particle, the kinetic condition setting unit sets a region indicating a position of the corresponding emission source,” the

examiner points to Figure 1, element 15, and Figures 2, 7, 8b, and 10 of Misaka, or Figure 1 of Baumann.

With regard to the claim limitation of “the particle motion computing unit generates each adsorbate particle in accordance with the position of the corresponding emission source,” the examiner points to Figure 1, element 15, of Misaka or Figure 1 of Baumann, finding such limitation “inherent.”

For their part, appellants argue that the examiner has not established a prima facie case of obviousness because the examiner relies on assertions of “inherency” which have been traversed by appellants but have not been substantiated by the examiner via the presentation of any concrete evidence in support thereof.

While it is true that appellants make no substantive arguments as to the merits of the prior art rejections in terms of whether the prior art describes what the examiner alleges it describes, appellants have no duty to make any substantive arguments or present any other evidence of non-obviousness until and unless the examiner, in the first instance, presents a prima facie case of obviousness.

It is our view that the examiner has not presented such a prima facie case in the rejection of claims 1, 3-9, 11-20, and 22-31 under 35 U.S.C. § 103 over either one of Misaka or Baumann in view of the “examiner’s own experience,” or Official Notice. Too much of the rationale for this rejection relies on “inherency.” For example, with respect to claim 1, the examiner contends that the kinetic condition setting unit is “inherent in particle simulators such as Monte Carlo

simulators” (answer-page 51). The examiner contends that the claimed particle motion computing unit which generates individual particles in accordance with the information set by the kinetic condition setting unit and computes motion of the generated adsorbate particles... is “inherent in particle simulators such as Monte Carlo simulators” (answer-page 51).

To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.’ In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) citing Continental Can Co. v. Monsanto Co., 948 F.3d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. Id. At 1269, 20 USPQ2d at 1749 (quoting In re Oelrich, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981). When the examiner’s allegation of “inherency” is challenged by appellants, as it was here, the examiner is put to his/her proof to offer some evidence to show the truth of that allegation. Yet, even though appellants have challenged the examiner’s assertions of inherency, as to the kinetic condition setting unit and the particle motion computing unit, the examiner has offered nothing except more of the same allegations of “inherency.” For example, at page 32 of the answer, in response to appellants’ challenge, the examiner asserts that, with regard to a particle source for particle simulation, he “is at odds to think of how such a simulation could be carried out without specifying a source. The particles must be accounted for at all times in their trajectories, including initial conditions.”

If the examiner is so hard pressed to think of how the simulation can be carried out without specifying a source, then the examiner should have had no difficulty in offering some concrete evidence showing such simulations with a specified source. Instead of getting into an argument with appellants as to whether appellants earlier acquiesced in these assertions of “inherency” and whether appellants should be permitted, this late in the prosecution, to challenge the assertion of inherency (bottom of page 22 of the answer), the examiner’s time would have been better spent by merely offering the concrete evidence to support these inherency allegations. We find no such evidence.

Accordingly, the rejection of claims 1, 3-9, 11-20, and 22-31 under 35 U.S.C. § 103 over either one of Misaka or Baumann in view of the examiner’s own experience, is reversed.

With regard to the rejection of claims 1, 3-9, 11-20, 22-26, and 28-31 under 35 U.S.C. § 103 over various combinations of Yamada, Misaka, Baumann, Husinsky, Kinema/SIM, Reeves and Cohen, we also will not sustain this rejection as, in our view, the examiner has failed to establish a prima facie case of obviousness.

The examiner indicates, at pages 66-68, what is generally allegedly shown by each of Yamada, Misaka, Baumann and Husinsky, but the examiner not once applies any of these teachings specifically to the language of each claim, indicating what, in each reference, allegedly corresponds to each of the claim limitations. Mere general allegations of broad disclosures of each of the references is not enough to make a prima facie case of obviousness. For example, at page 67 of the answer, the examiner points to pages 4.4.1, and Figures 1-2 of Baumann, and

states that Baumann discloses “3D modeling of sputtering using a mesoscopic hard-sphere Monte Carlo model (see fig. 1 of Baumann et al.). Baumann et al. simulate the behavior of *clusters* as they interact with a substrate (note that the use of ion cluster beams and molecular beams for deposition and/or sputtering are well known techniques; this phenomena has also been simulated.)”

The examiner then goes on to say that Baumann (as well as Yamada or Misaka or Husinsky) “discloses all claim limitations except for a teaching animation of the simulation” (answer-page 68), relying on Kinema/SIM or Reeves or Cohen for a teaching of such animation.

We do not understand how the examiner can contend that each of the primary references discloses all claim limitations except for the animation limitation. Taking Baumann, for example, with regard to instant claim 1 for example, based on the examiner’s description of Baumann, where, exactly, does the examiner find “a kinetic condition setting unit,” as claimed? Where, exactly, does the examiner find “a particle motion computing unit,” as claimed? Where, exactly, in Baumann, does the examiner find the claimed functions of the kinetic condition setting unit and the particle motion computing unit? The examiner does not say.

Moreover, why are the references to Kinema/SIM, Reeves and Cohen applied to claims, such as claim 1, which do not recite anything about “animation” since these secondary references are allegedly applied for the animation limitation?

Since no prima facie case of obviousness has been shown by the examiner, appellants were not obliged to argue any of the specifics of the examiner's rationale.

With regard to the rejection of claims 1, 3-9, 11-20, and 22-31 under 35 U.S.C. § 103 over Ohira in view of either one of Kinema/SIM or Reeves of Cohen, the examiner asserts, broadly, that Ohira discloses details of a molecular-dynamics simulation of sputtering (referring to the abstract, page 2 and Figure 1) and that Ohira "discloses all claim limitations...except for a teaching of animation of the simulation" (answer-page 72), relying, again, on either Kinema/SIM, Reeves, or Cohen to supply the animation teaching.

However, once again, the examiner offers no cogent rationale as to how the primary reference, to Ohira, is specifically applied against the claims. Taking instant claim 1, again as an example, where, exactly, in Ohira, does the examiner find "a kinetic condition setting unit," as claimed? Where, exactly, does the examiner find "a particle motion computing unit," as claimed? Where, exactly, in Ohira, does the examiner find the claimed functions of the kinetic condition setting unit and the particle motion computing unit? The examiner does not say.

Further, we again ponder the question as to why the references to Kinema/SIM, Reeves and Cohen are applied to claims, such as claim 1, which do not recite anything about "animation" since these secondary references are allegedly applied for the animation limitation.

Thus, we will not sustain the rejection of claims 1, 3-9, 11-20, and 22-31 under 35 U.S.C. § 103 over Ohira in view of either one of Kinema/SIM or Reeves of Cohen.

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## CONCLUSION

We have not sustained any of the rejections under 35 U.S.C. § 112, first or second paragraphs, and we have not sustained any of the rejections under 35 U.S.C. § 103.

Accordingly, the examiner's decision is reversed.

REVERSED

JAMES D. THOMAS  
Administrative Patent Judge

ERROL A. KRASS  
Administrative Patent Judge

JEAN R. HOMERE  
Administrative Patent Judge

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